

REMARKS

Claims 1, 3, 8 and 10 have been amended. New claims 15-17 have been added. Thus, claims 1-17 are now presented for examination. Support for the amendment to claims 1 and 8 may be found in the specification at page 16, lines 14-22. Support for the amendment to claims 3 and 10 may be found in the specification at page 17, lines 4-11. Support for new claim 15 may be found in the specification at page 10, lines 4-7. Support for new claim 16 may be found in the specification at the bottom of page 15, and the top of page 16. Support for new claim 17 may be found in the specification at page 14, line 12 to page 16, line 1. Thus, no new matter has been added. Reconsideration and withdrawal of the present rejection in view of the comments presented herein are respectfully requested.

Rejection under 35 U.S.C. 103(a)

Claims 1-14 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Allen et al. (US 6,165,678). The Examiner acknowledges that the prior art does not disclose an anticipatory example, or specifically name the claimed compositions. However, the Examiner alleges that since each of the components of the claimed compositions are described in Allen et al., it would have been obvious to have made any of the compositions described by the reference, including the claimed composition.

Claims 1-7, 15 and 16

Present claim 1 recites a resin for a resist, comprising structural units (a) derived from an (α -lower alkyl)acrylate ester as a principal component, wherein

said structural units (a) comprise structural units (a1) derived from an (α -lower alkyl)acrylate ester comprising an acid dissociable, dissolution inhibiting group, structural units (a2-1) derived from an (α -lower alkyl)acrylate ester comprising a lactone-containing monocyclic group, and structural units (a3) derived from an (α -lower alkyl)acrylate ester that comprises a polar group-containing aliphatic hydrocarbon group, wherein

said structural units (a1) comprise structural units (a1-1) derived from an (α -lower alkyl)acrylate ester and represented by the general formula (a1-1), and

said polar group-containing aliphatic hydrocarbon group is a hydroxyl group-containing aliphatic hydrocarbon group.

Allen et al. disclose a lithographic photoresist composition comprising a radiation-sensitive acid generator and a copolymer comprising a first monomer unit having a pendant group containing an organic polar moiety that is photoacid-stable, non-acidic and ~~non-hydroxylic~~, and a second monomer unit having a pendant group that is photoacid-cleavable, wherein the first monomer unit has the structural formula (I), and the second monomer unit has the structural formula (II).

The Examiner alleges that Allen et al. describes monomeric units containing monocyclic aliphatic groups such as 1-methylcyclohexyl group, as a structural unit corresponding to the structural unit (a1-1) of claim 1, and that Allen et al. describes monomeric units containing methacrylic monocyclic lactones such as the following structure, as a structural unit corresponding to the structural unit (a2-1) of claim 1.



Claim 1 as amended recites that the structural unit (a3) contains a structural unit derived from an (α -lower alkyl)acrylate ester that comprises a hydroxyl group-containing aliphatic hydrocarbon group, in addition to the structural units (a1) and (a2). In contrast, col. 5, lines 16-21 of Allen et al. describe the following as the monomeric unit (I) which contains an organic polar moiety such as lactone.

Monomeric unit (I) contains a pendant group R_p containing an organic polar moiety which is generally not cleaved or otherwise chemically modified upon contact with the photoacid generated during exposure of the composition to radiation (i.e., because it cannot form a stable carbonium ion in acid), and which is both non-acidic and non-hydroxylic.

Thus, Allen et al. clearly excludes a hydroxyl group-containing group as the organic polar moiety. Because this group is specifically excluded by this reference, claim 1, and claims 2-7, 15 and 16, which depend either directly or indirectly on claim 1, cannot be obvious over this reference.

Claims 8-14, 15 and 17

Present claim 8 recites a resin for a resist, comprising structural units (a) derived from an (α -lower alkyl)acrylate ester as a principal component, wherein

said structural units (a) comprise structural units (a1) derived from an (α -lower alkyl)acrylate ester comprising an acid dissociable, dissolution inhibiting group, structural units (a2) derived from an (α -lower alkyl)acrylate ester comprising a lactone-containing monocyclic or polycyclic group, and structural units (a3) derived from an (α -lower alkyl)acrylate ester that comprises a polar group-containing aliphatic hydrocarbon group, wherein

said structural units (a1) comprise structural units (a1-1-1) derived from a methacrylate ester and represented by the general formula (a1-1-1), and

said polar group-containing aliphatic hydrocarbon group is a hydroxyl group-containing aliphatic hydrocarbon group.

As recited in claim 1, present claim 8 recites a structural unit derived from an (α -lower alkyl)acrylate ester that comprises a hydroxyl group-containing aliphatic hydrocarbon group as the structural unit (a3), in addition to the structural units (a1) and (a2).

Therefore, claim 8, and claims 9-14, 15 and 17 which depend either directly or indirectly on claim 8, are not obvious over Allen et al. which excludes the use of a hydroxylic group as an organic polar moiety as discussed above.

Unexpected results

Examples 1 and 2 of the present specification demonstrate that, when the resin recited in claim 1 is used, excellent depth of focus, mask error factor and line edge roughness can unexpectedly be achieved. Also, as demonstrated by Example 3 of the present specification, when the resin recited claim 8 was used, a reduced level of irregularities within the internal walls of the hole pattern was unexpectedly observed. These unexpected results are neither disclosed nor suggested by the cited reference, nor could they have been predicted based on this reference. Thus, the claimed invention provides unexpected results, which are strong evidence of the nonobviousness of the claimed invention, and would effectively rebut and *prima facie* case of obviousness, even if one were present.

In view of the comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a).

CONCLUSION

Applicants submit that all claims are in condition for allowance. However, if minor matters remain which could be resolved by telephone, the Examiner is invited to contact the undersigned at the telephone number provided below. If any additional fees are required, please charge these to Deposit Account No. 11-1410. Should there be any questions concerning this application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 12/19/08

By: Neil S. Bartfeld

Neil S. Bartfeld, Ph.D.
Registration No. 39,901
Agent of Record
Customer No. 20,995
(619) 235-8550

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